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EXAMINER

COLBERT, ELLA

ART UNIT PAPER NUMBER

3624

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/892,161

Applicant(s)

OHRAN, MICHAEL R.

Examiner

Ella Colbert

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-39 are pending. Claims 1-4, 7-9, 11, 14-20, 26, 28, 30, 31, 33, and 36-39 have been amended in this communication filed 12/10/04 entered as Response After Non-Final Action.
2. The amendments to the specification have overcome the Objection to the Specification and is herein withdrawn.
3. The 35 U.S.C. 112 second paragraph rejection has been overcome by Applicants' amendments to claims 1-4, 7-9, 11, 14, 16-20, 28, 30, 31, 33, and 36-39 and is herein withdrawn.
4. The 35 U.S.C. 101 Rejection of claims 1-19 and 28-39 has been overcome by the amendment to claims 1-19 and 28-39 and is herein withdrawn.

Claim Objections

5. Claims 1, 3, 8, 9, and 16 are objected to because of the following informalities:
Claim 1, page 9, line 15 recites "device, wherein the data is stored in a virtual shared storage node from the standpoint". This line would be better recited as "device, wherein the data is stored in a virtual shared storage node". Claim 8, page 11, line 3 and claim 16, page 15, line 18 has a similar problem. Claim 3, page 10, line 3 recites "... , wherein the infrastructure is also used by". This line would be better recited as "... , wherein the infrastructure is used by". Claim 9, page 12, line 7 recites "server that appears to". This line would be better recited as "server that". Claim 16, page 15, lines 4 and 5 recites "... of a second server so as to establish a virtual storage area network ...". These lines would be better recited as "... of a second server to establish a virtual

storage area network ...". Applicant is respectfully requested to check for other informalities similar to the informalities above in claims 1, 3, 8, 9, and 16. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-22 and 28-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over (WO 95/00906) Rollins et al, hereafter Rollins in view of (US 5,157,663) Major et al, hereafter Major.

As per claim 1, Rollins teaches, A method of mirroring data stored on a first server having a first mass storage device to a second server having a second mass storage device so as to establish a virtual storage area network, the method comprising: receiving a write request at the first server from a network device (page 6, lines 1-15); determining that the first server has write access to the first mass storage device and to the second mass storage device (page 7, lines 10 -21 and page 8, line 16-page 9, line 14); executing the write request at the first server so as to write data to the first mass storage device (page 26, lines 5-21). Rollins failed to teach, using a mirror engine of the first server, transmitting a copy of the write request to the second server; and

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executing the copy of the write request at the second server so as to write the data to the second mass storage device, thereby mirroring the data at the second mass storage device, wherein the data is stored in a virtual shared storage node from the standpoint of the first server and the second server. Major teaches, using a mirror engine of the first server, transmitting a copy of the write request to the second server (col. 8, lines 56-64); and executing the copy of the write request at the second server so as to write the data to the second mass storage device, thereby mirroring the data at the second mass storage device, wherein the data is stored in a virtual shared storage node from the standpoint of the first server and the second server (col. 9, lines 17-36). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a mirror engine of the first server, transmit a copy of the write request at the second server so as to write the data to the second mass storage device, thereby mirroring the data at the second mass storage device, wherein the data is stored in a virtual shared storage node from the standpoint of the first server and the second server and to combine Rollins' receiving a write request at the first server from a network device; determining that the first server has write access to the first mass storage device and to the second mass storage device; and executing the write request at the first server so as to write data to the first mass storage device with Major's using a mirror engine of the first server, transmitting a copy of the write request to the second server; and executing the copy of the write request at the second server so as to write the data to the second mass storage device, thereby mirroring the data at the second mass storage device, wherein the data is stored in a virtual shared storage node from

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the standpoint of the first server and the second server because such a combination would allow Rollins' and Major's systems to have the ability to backup data and to restore the data without losing any of the data because of a network disaster.

As per claim 2, Rollins teaches, A method of mirroring data as recited in claim 1, wherein transmitting a copy of the write request comprises transmitting the copy of the write request using a dedicated link between the first server and the second server (page 15, lines 4-17 and page 23, line 13 – page 24, line 12).

As per claim 3, Rollins teaches, A method of mirroring data as recited in claim 1, wherein transmitting a copy of the write request comprises transmitting the copy of the write request using infrastructure of the network, wherein the infrastructure is also used by the network to transmit data between workstations and servers (page 13, line 16 – page 14, line 14 and page 17, line 3- page 18, line 12).

As per claim 4, Rollins teaches, A method of mirroring data as recited in claim 1, further comprising: experiencing a failure such that the data is not accessible from the first mass storage device; and executing a read request for data that has been written to the first mass storage device by accessing the data that has been mirrored at the second mass storage device (page 10, lines 1-21).

As per claim 5, Rollins teaches, A method of mirroring data as recited in claim 4, wherein the failure comprises the first server going offline (page 21, line 18 –page 23, line 12).

As per claim 6, Rollins teaches, A method of mirroring data as recited in claim 4, wherein the failure comprises a failure of the first mass storage device (page 22, lines 8-18).

As per claim 7, Rollins failed to teach, A method of mirroring data as recited in claim 1, further comprising using a policing protocol, prior to executing the write request at the, first server, to determine whether the first server has write access.

Major teaches, A method of mirroring data as recited in claim 1, further comprising using a policing protocol, prior to executing the write request at the, first server, to determine whether the first server has write access (col. 2, lines 42-63 and col. 6, lines 39-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a policing protocol, prior to executing the write request at the, first server, to determine whether the first server has write access and to combine Rollins' first server with the write access with Major's using a policing protocol prior to executing the write request at the, first server, to determine whether the first server has write access because such a modification would allow Rollins' and Major's systems to have the servers synchronized prior to the secondary operating system reaching a stable state.

As per claim 8, Rollins failed to teach, A method of mirroring data as recited in claim 3, wherein executing the write request at the first server comprises using an I/O driver at the first server to initiate execution of the write request, wherein, from the standpoint of the I/O driver, the write request virtually appears to have been stored in a shared storage node of a storage area network. Major teaches, A method of mirroring

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data as recited in claim 3, wherein executing the write request at the first server comprises using an I/O driver at the first server to initiate execution of the write request, wherein, from the standpoint of the I/O driver, the write request virtually appears to have been stored in a shared storage node of a storage area network (col. 4, lines 5-31). It would have been obvious to one having ordinary skill in the art at the time the invention was made to execute the write request at the first server comprises using an I/O driver at the first server to initiate execution of the write request, wherein, from the standpoint of the I/O driver, the write request virtually appears to have been stored in a shared storage node of a storage area network and to combine Rollins' mirroring data with Major's executing the write request at the first server comprises using an I/O driver at the first server to initiate execution of the write request, wherein, from the standpoint of the I/O driver, the write request virtually appears to have been stored in a shared storage node of a storage area network because such a combination would allow Rollins' and Major's systems to have an input/output driver writes the request into the request queue and the requests is read and stored on mass storage devices.

As per claim 9, Rollins teaches, A method of mirroring data stored on a first server having a the first mass storage device to the second mass storage device of a second server so that the data is accessible to the first server and the second server through a virtual storage area network, the method comprising: establishing a virtual storage area network between the first server and the second server that appears to include a virtual shared storage node, wherein the virtual shared storage node physically includes the first mass storage device (page 17, line 3- page 18, line 12); the

second mass storage device (page 18, line 13- page 19, line 5); means for mirroring data between the first mass storage device and the second mass storage device (page 20, lines 4-15); and means for communicating between the first server and the second server (page 17, lines 3-18). This independent claim is rejected for the similar rationale as given above for claim 1.

As per claim 10, Rollins failed to teach, A method of mirroring data as recited in claim 9, wherein said means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server. Major teaches, wherein said means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server (col. 9, lines 17-36). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server and to combine Rollins' mirroring data with Major's means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server because such a combination would allow Rollins' and Major's systems to have a primary engine and a secondary engine for mirroring data with both engines being synchronized.

As per claim 11, this dependent claim is rejected for the similar rationale as given above for claims 2, 3, and 10.

As per claim 12, this dependent claim is rejected for the similar rationale as given above for claim 1.

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As per claim 13, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 14, this dependent claim is rejected for the similar rationale as given above for claim 4.

As per claim 15, this dependent claim is rejected for the similar rationale as given above for claims 8 and 9.

As per claim 16, this dependent claim is rejected for the similar rationale as given above for claims 1, 7, 8 and 14.

As per claim 17, this dependent claim is rejected for the similar rationale as given above for claim 7.

As per claim 18, this dependent claim is rejected for the similar rationale as given for above for claim 3.

As per claim 19, this dependent claim is rejected for the similar rationale as given above for claims 4 and 14.

As per claim 20, this independent claim is rejected for the similar rationale given to claims 1-19.

As per claim 21, this dependent claim is rejected for the similar rationale as given above for claim 2.

As per claim 22, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 28, this dependent claim is rejected for the similar rationale as given above for claim 1.

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As per claim 29, this dependent claim is rejected for the similar rationale as given above for claim 8.

As per claim 30, this dependent claim is rejected for the similar rationale as given above for claim 2.

As per claim 31, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 32, this dependent claim is rejected for the similar rationale as given above for claim 10.

As per claim 33, this dependent claim is rejected for the similar rationale as given above for claim 14.

As per claim 34, this dependent claim is rejected for the similar rationale as given above for claim 5.

As per claim 35, this dependent claim is rejected for the similar rationale as given above for claim 6.

As per claim 36, this dependent claim is rejected for the similar rationale as given above for claim 2.

As per claim 37, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 38, this dependent claim is rejected for the similar rationale as given above for claim 8.

As per claim 39, this dependent claim is rejected for the similar rationale as given above for claim 7.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over (WO 95/00906) Rollins et al, hereafter Rollins and (US 5,157,663) Major et al, hereafter Major in view of (US 5,276,867) Kenley et al, hereafter Kenley.

As per claim 23, Rollins and Major failed to teach, A virtual storage area network as recited in claim 20, further comprising a third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage device. Kenley teaches, A virtual storage area network as recited in claim 20, further comprising a third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage device (col. 2, lines 44-55, col. 4, lines 61-66, and col. 6, lines 40-56). It would have been obvious to one having

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ordinary skill in the art at the time the invention was made to have a third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage device and to combine Rollins' data mirroring and Major's O/I engine with Kenley's third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage device because such a combination would allow Rollins', Major's and Kenley's systems to have a third server as a backing store (hierarchical storage server that has a higher capacity and lower speed than the secondary storage and can include erasable optical, write-once-read-many (WORM disks, or tape volumes.

As per claim 24, Rollins and Major failed to teach, A virtual storage area network as recited in claim 23, further comprising means for communicating between the third server and the first server and also between the third server and the second server. Kenley teaches, A virtual storage area network as recited in claim 23, further comprising means for communicating between the third server and the first server and also between the third server and the second server (col. 7, lines 51-62). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have means for communicating between the third server and the first server and also

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between the third server and the second server and to combine Rollins' data mirroring and Major's O/I engine with Kenley's communicating between the third server and the first server and also between the third server and the second server because such a combination would allow Rollins', Major's and Kenley's systems to have the backing storage (third server) to have control fro the backup system by using a baseline backup and an incremental backup.

As per claim 25, Rollins failed to teach, A virtual storage area network as recited in claim 20, wherein the first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device.

Major teaches, A virtual storage area network as recited in claim 20, wherein the first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device (col. 2, lines 42-63 and col. 6, lines 39-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device and to combine Rollins' data mirroring with Major's first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device because such a combination would allow Rollins' and

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Major's systems to have a high speed connection and to have the primary and backup processing systems on separate computers.

As per claim 26, this dependent claim is rejected for the similar rationale as given above for claims 23-25.

As per claim 27, this dependent claim is rejected for the similar rationale as given above for claims 23-26.

Response to Arguments

10. Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Burkes et al (US 5,659,704) discloses maximum storage space for mirror redundancy.

Beardsley et al (US 5,148,540) discloses the backup of data storage and recovery after a power loss.

Jewett et al (EPO 0433979) discloses a fault-tolerant computer system with a configuration file system.


Bergsten (US 6,073,209) discloses hosts with access to multiple storage subsystems.

Inquiries

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ella Colbert whose telephone number is 703-308-7064. The examiner can normally be reached on Monday-Thursday, 6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent Millin can be reached on 703-308-1038. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


E. Colbert
March 5, 2005